

FACT SHEET:

Impacts and management of the African tulip tree in Fiji

African tulip tree (*Spathodea campanulata*)

History

Native to Africa, the African tulip tree was brought to Fiji in 1936 as an ornamental plant. It escaped suburban gardens and now dominates disturbed land throughout much of the country. It is on the IUCN/ISSG list - 100 of the World's Worst Invasive Alien Species.

General information

The African tulip tree favours moist habitats, growing best in sheltered tropical areas. It invades agricultural and natural ecosystems, shading-out vegetation when it becomes the dominant tree in the landscape.

Although considered an agricultural pest, it does provide some benefits, such as building materials, carbon sequestration, and erosion control. However, the timber has high water content, making it a less desirable source of firewood.

It is a difficult tree to control with conventional methods such as manual weeding, which results in high infestation levels. This has led some farmers to abandon their existing fields and clear nearby natural forests, further contributing to biodiversity loss and exacerbating the spread of the tree.

Socio-economic impacts

Surveys of 360 households in 30 randomly selected villages in eastern Viti Levu, Fiji, were carried out to assess the socio-economic impacts of the tulip tree. According to the survey results, tulip trees reduce agricultural yields and available grazing land. They also compete with more desirable trees used for medicinal purposes and/or firewood.

Some respondents indicated that, despite its high moisture content, they use the tree for building materials and firewood. Others reported that the tree attracts birds and other wild animals. Nevertheless, the tree was viewed extremely negatively by most respondents.

Current control practices of cutting the trunk and burning stumps has not curtailed the spread of the tree, and survey respondents report that farmers have stopped growing crops altogether in severely impacted fields. Most respondents state that the tulip tree has a negative impact on their livelihoods, with some spending considerable effort to control the tree. The average household currently spends 35 hours/week managing their crops, with about 10% of that time specifically allocated to controlling the tulip tree. This emphasises respondents' high willingness to work to alleviate the problem, provided that cost-effective control methods are available. Despite putting some effort into tulip tree management, more than 95% of villages indicated that tree populations were increasing.

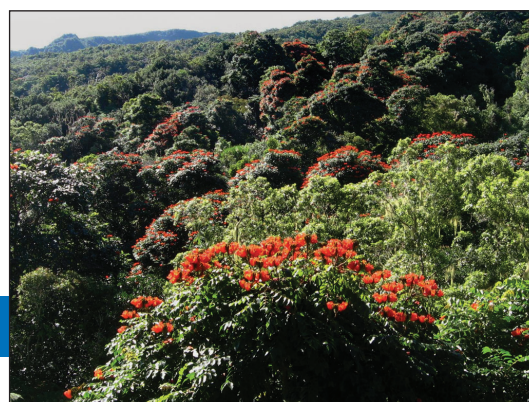


Photo: Jean-Yves Myer

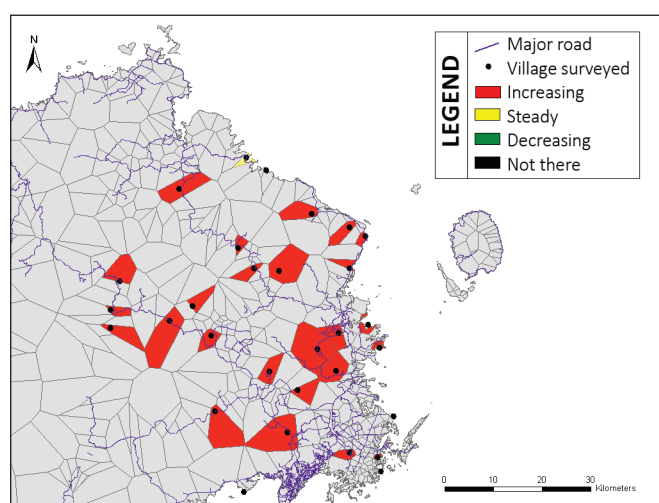


Fig.1. State of African tulip tree in Viti Levu villages surveyed (n=30)



Landcare Research
Manaaki Whenua



Pacific
INVASIVES
INITIATIVE



CRITICAL ECOSYSTEM
PARTNERSHIP FUND

Survey respondents were asked to reallocate Fiji’s national budget according to their own spending priorities. They would allocate, on average, 7% of the budget to invasive species management. Of that 7% of the national budget, the respondents believe that 33% should be directed to controlling the African tulip tree.

Benefits and costs at village level

An economic analysis was conducted to assess the relative costs and benefits for the following management options:

Do nothing

This option means that the tree will continue to grow naturally and spread across the landscape in the absence of management, so it would eventually occupy all ecologically suitable environments.

Current management approach

Survey results show that households spend an average of 24 person days/year clearing tulip trees. Activities include cutting, stacking, and drying wood in addition to burning stumps. Regrowth from the cut stumps, roots, and other plant material left in contact with the ground is common. Tractors and diggers have been used to clear smaller trees, but this disturbance often leads to increased germination of seeds in the soil seed bank. Herbicides have also been applied in some cases. However, incorrect herbicide use has resulted in poor levels of control. Although this approach can reduce some of the potential damage caused by the tulip tree, most villages surveyed reported an increase in trees in their community. This option would allow a 50% population increase, compared to a 100% population increase under ‘do nothing’ scenario.

Integrated management approach

This approach involves the selection of a suitable treatment method appropriate to the site, size and extent of the infestation, and the intended land-use following management. Treatment methods include:

- ‘hack-and-squirt’ for trees greater than 10 cm in diameter at breast height.
- ring-barking of larger trees.
- cut-stump treatment applications to saplings and small trees.
- hand pulling of seedlings.

Where possible, land is mechanically cleared with bulldozers after treatment. This process is followed by replanting crops or pasture grass. Subsequently, herbicides and/or hand-pulling are used to control all emerging seedlings including other invasive plant species. As eradication is not an option, this scenario assumes an integrated management programme could reduce infestations by 90% and maintain it at that level.

Conclusion

The cost-benefit analysis for the three management options reveals that the integrated management approach offers the greatest benefit per dollar spent, i.e., it is the most efficient use of funds. Specifically, benefit-cost ratios indicate that managing the tulip tree at the village level using an integrated management approach provides benefits that are four times larger than the “do nothing” approach. Maintaining current management approaches entails lower investment, but the benefits per dollar spent managing the African tulip tree are also considerably lower than under the integrated management approach. Both approaches are nevertheless significantly better than doing nothing from the cost-benefit perspective.

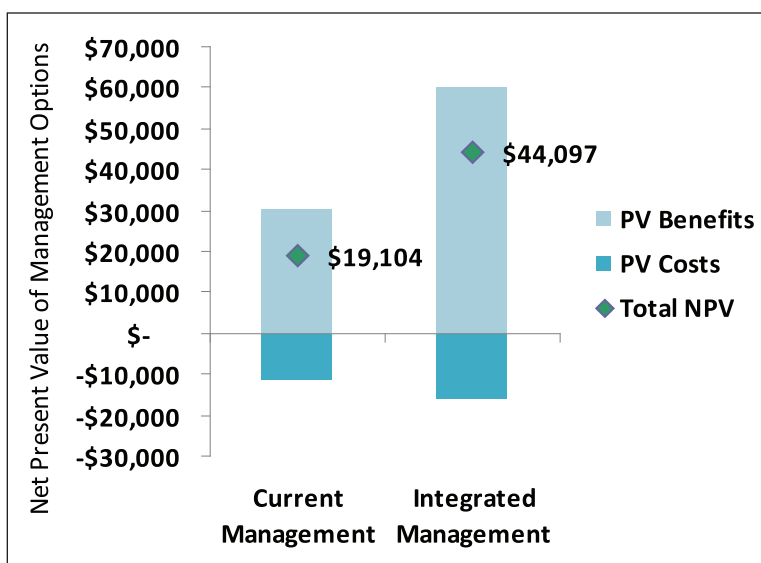


Fig. 2. Net Present Value (FJD/ha) of African tulip tree management

The cost-benefit analysis is available at: www.landcareresearch.co.nz/publications/researchpubs/CEPF-valuing-invasives.pdf